Claim rejections – 35 USC § 103

1.   Applicant acknowledges the Examiner's rejection of claims 1 and 2 under 35 U.S.C. § 103(a) as unpatentable over Motozaki et al. (JP11-13840A) and further in view of Wujick (US 4,703,979), but respectfully traverses this rejection.

2.   Regarding **claim 1**, the Examiner acknowledges that Motozaki et al. does not disclose the claim limitation for the range of the parameter "1-W tan θ/Pt", namely from -0.2 to 0.75. Furthermore, the Applicant respectfully points out that Motozaki et al. does not even disclose a belt within the claimed range of that parameter. Motozaki et al.'s example belt has 1-W tan θ/Pt=0.84 (applying the values given in ¶ [0031]). Motozaki et al.'s comparative example 1 appears to have zero helix angle, giving 1-W tan θ/Pt=1 ([0032]).

The Examiner also implicitly acknowledges that Motozaki et al. does not disclose the claim limitation for the range of backlash, namely *"from 1.6 to 3% of said tooth pitch"*. The Examiner points out that [0038] of Motozaki et al. refers to the backlash as "small", with no concrete specification whatsoever. The Applicant respectfully points out, that not only does Motozaki et al. merely teach "small" backlash in relation to straight-tooth belts ([0006]), they also seem to teach that smaller is better (see e.g. ¶ [0012]), even down to zero backlash (see e.g. ¶ [0024] ("belt pulley tooth point 23 is contacted, or a backlash exists slightly")), and they appear to refer to a different kind of backlash from the Applicant (compare Motozaki's Fig. 3a with FIG. 3 of the present invention).

Motozaki et al. work in a different field and to solve a different problem than the Applicant. Motozaki et al. are working on toothed belts for document transport in printers, which performing reciprocating and one-way movements. They seek to improve printing accuracy and conveying precision and to make the momentary speed variation of the belt small. In contrast, the Applicant is working in the field of helically-toothed power transmission belts operated at high rotational speeds and under heavy loads, and Applicant seeks to reduce noise and vibration. Nothing in Motozaki et al.

suggests that the combination of setting the helix angle "*in the range of -0.2 ≤ 1-W tan θ/Pt ≤ 0.75*" and setting backlash "*to be from 1.6 to 3% of said tooth pitch*" could solve the Applicant's problem, or any other problem.

An obviousness rejection as routine experimentation according to MPEP § 2144.05 II is not appropriate in this case. "A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. *In re Antonie*, 559 F.2d 618, 195 USPQ 6 (CCPA 1977)." MPEP § 2144.05 IIB. Since Motozaki et al. did not recognize that noise and vibration in helically-toothed-belt transmission devices were a function of the combination of backlash and a parameter based on helix angle, width, and pitch, the parameters optimized were not recognized to be result-effective, and therefore, optimization of these parameters is not obvious or routine experimentation.

Since Motozaki et al. fails to disclose all the limitations of claim 1 or any belt within any of the ranges, and since claim 1 cannot be said to be routine optimization based on the teachings of Motozaki et al., withdrawal of the rejection of claim 1 is respectfully requested.

3. Regarding **claim 2**, the Examiner acknowledges that Motozaki et al. does not disclose the claim limitation for the range of setting the helix angle "*in a range of 1-W tan θ/Pt ≤ 0*" nor any belt within that range.

Wujick discloses a toothed power transmission belt with tooth compression of 3.4 or 3.7%, which is said to substantially reduce the land wear problem mentioned in prior art (col. 2 lines 20-22). However, Wujick does not mention anything about printer transport belts with printing accuracy and conveying precision problems as concerns Motozaki et al, and there is no mention in Motozaki et al. about land wear problems. Thus, there is no reason for one of skill in the art to combine Wujick and Motozaki et al. Furthermore, Wujick does not mention anything about helical-tooth drive systems, or about noise or vibration problems, so there is no reason for the Applicant to turn to Wujick to solve his problem. For the reasons stated above regarding claim 1, there is no reason for the Applicant to turn to Motozaki et al. Finally, even upon combining the

references, there is no recognition in the cited art that the claimed parameter is result-effective in the claimed range and in combination with the claimed range of tooth compression, so the modification suggested by the Examiner is not obvious and is not routine optimization. The motivation to combine stated by the Examiner, "to achieve a better belt and pulley configuration," falls short of a "clear articulation of the reasons why the claimed invention would have been obvious" and therefore cannot support any rejection under 35 USC 103. MPEP § 2141 III.

Since the combination of Wujick and Motozaki et al. is not supported with a clear articulation of a rationale to combine, and since the combination fails to disclose all the limitations of claim 2, and since claim 2 cannot be said to be routine optimization based on the teachings of Wujick and Motozaki et al., withdrawal of the rejection of claim 2 is respectfully requested.

4. Applicant acknowledges three additional prior art references made of record but not relied on by the Examiner. These three references are felt to be less pertinent to the claimed invention than those relied on by the Examiner. In particular they relate to belts with two adjacent rows of oppositely balanced, oblique and offset teeth.

<u>FEE STATEMENT</u>

Any fees which may be required as a result of the amendments made herein, including the fee for the extension of time, are authorized to be charged to Assignee's deposit account number 07-0475.

In light of the forgoing amendments and remarks, favorable reconsideration of the allowability of both claims is respectfully solicited.

Respectfully submitted,

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